

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

MASTER OF IT (MULTIMEDIA COMPUTING)
TRIMESTER 1, 2015/2016

TIS 7011 – MULTIMEDIA SYSTEMS TECHNOLOGY

(All Sections)

28 SEPTEMBER 2015

10 a.m. – 12 p.m.

(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **4** pages with **5** questions only.
2. Attempt **FOUR** out of **FIVE** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please print all your answers in the Answer Booklet provided.

Question 1 [10 marks]

A. Figure 1 shows the storyboard of a webpage.



Figure 1: Storyboard

- I. Describe the different types of time independent media. [2 marks]
- II. Text and graphics are used in this webpage. Identify the type of these media. [1 mark]
- III. What are the differences between serif and sans serif fonts? [2 marks]
- IV. Identify which texts elements are serif fonts and sans serif fonts in the webpage. [2 marks]

B. Differentiate between bitmap and vector images in terms of their scalability, storage capacity and computing power requirements. [3 marks]

Question 2 [10 marks]

A. Refer to Figure 2 below; briefly describe the four main phases of image compression. [4 marks]

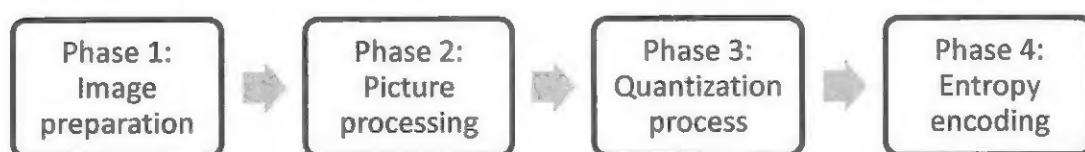


Figure 2: Image Compression

Continued ...

- B. Describe the different frame types in MPEG GOP (group-of-picture) layer. [3 marks]
- C. Compress the 2-bit image below using run-length encoding and calculate the compression ratio. [3 marks]

1	1	1	0	0
0	0	0	3	3
3	3	3	3	3
2	2	2	0	0

Figure 3: 2-bit image

Question 3 [10 marks]

- A. Describe the following modes of multimedia communication:
- I. Unicast [1 mark]
 - II. Multicast [1 mark]
 - III. Broadcast [1 mark]
- B. Data link is a one of the seven layers in the OSI architecture.
- I. What is the task of this layer? [1 mark]
 - II. List three roles of the MAC sub layer. [3 marks]
 - III. Describe the MAC communication protocol known as the "reservation protocol". [3 marks]

Question 4 [10 marks]

- A. Figure 4 shows the architecture of a real time multimedia.

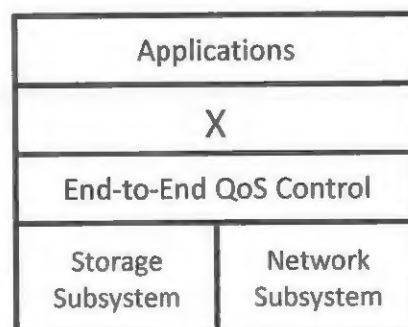


Figure 4: Networked multimedia server

- I. Identify the layer marked as "X" and describe its functions. [3 marks]

Continued ...

- II. Describe three parameters that can be used to determine the quality of service (QoS) for multimedia data transmission. [3 marks]
- B. Applications such as e-commerce usually need to ensure that they can provide priority data service class. What are the characteristics of this multimedia service class? [2 marks]
- C. Explain the following terms in relation to real time multimedia traffic:
- I. translation [1 mark]
 - II. mixing [1 mark]

Question 5 [10 marks]

- A. You are asked to design the user interface of a multimedia kiosk. This kiosk will display the image of a famous superhero character while playing the theme song of this character's movie. The theme song is saved as a digital audio and the image is saved as an uncompressed bitmap image.
- I. What are the factors that determine the quality of digital audio? [2 marks]
 - II. Calculate the size of the audio file, if it has the following characteristics: duration of 25 seconds, stereo audio, recorded at 44.1 kHz and 16-bit resolution. [2 marks]
 - III. Calculate the size of the image if it is a 24-bit colour image with spatial resolution of 1092 x 780 pixels. [2 marks]
- B. Describe the following types of priority in relation to the delivery of multimedia data and give one example for each type of priority:
- I. priority for types of media [2 marks]
 - II. priority for uncompressed audio [2 marks]

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